CLAIMS

What is being claimed is:

1. A light emitting device comprising:

a region of first conductivity type;

a region of second conductivity type;

an active region disposed between the region of first conductivity type and the region of second conductivity type, the active region being capable of emitting light having a wavelength λ_n in the region of second conductivity type; and

a surface reflective of the light emitted by the active region, wherein one of the region of first conductivity type and the region of second conductivity type is disposed between the active region and the reflective surface;

wherein the active region has a total thickness less than or equal to about $0.25\lambda_n$ and wherein a portion of the active region is located between $0.6\lambda_n$ and $0.75\lambda_n$ from the reflective surface.

2. The light emitting device of Claim 1 wherein the active region comprises two quantum well layers separated by a barrier layer.

3. The light emitting device of Claim 2 wherein each of the quantum well layers has a thickness ranging between about 10 and about 60 angstroms, and wherein the barrier layer has a thickness ranging from about 50 to about 200 angstroms.

4. The light emitting device of Claim 1 wherein the active region comprises three quantum well layers separated by two barrier layers.

5. The light emitting device of Claim 1 wherein the active region has a total thickness less than or equal to about $0.15\lambda_n$.

6. The light emitting device of Claim 1 wherein a physical center of the active region is located at a distance from a surface of the electrode corresponding to within $0.05\lambda_n$ from a local maximum in extraction efficiency.

7. The light emitting device of Claim 1 wherein a center of brightness of the active region is located at a distance from a surface of the electrode corresponding to within $0.05\lambda_n$ from a local maximum in extraction efficiency.

8. The light emitting device of Claim 1 wherein the electrode has a reflectivity greater than 80% for light emitted by the active region.

9. The light emitting device of Claim 1 wherein the active region comprises at least one III-nitride layer.

10. The light emitting device of Claim 1 wherein the active region comprises at least one III-phosphide layer.

11. The light emitting device of Claim 1 wherein the electrode comprises silver.

12. The light emitting device of Claim 1 wherein the electrode comprises gold.

13. The light emitting device of Claim 1 wherein the electrode comprises aluminum.

14. The light emitting device of Claim 1 wherein:

the electrode is a first electrode; and

the first electrode is electrically connected to the region of second conductivity type, the light emitting device further comprising:

a second electrode electrically connected to the region of first conductivity type; and

a submount electrically connected to the first and second electrodes.

15. The light emitting device of Claim 14 further comprising:

a plurality of leads electrically connected to the submount; and

a lens overlying the active region.

16. The light emitting device of Claim 1 wherein:

the portion of the active region located between $0.6\lambda_n$ and $0.75\lambda_n$ from a surface of the electrode comprises a first portion of the active region; and

a second portion of the active region is located between $1.2\lambda_n$ and $1.35\lambda_n$ from a surface of the electrode.

17. The light emitting device of Claim 1 wherein the reflective surface is a surface of a metal electrode.

18. The light emitting device of Claim 1 wherein the reflective surface is a surface of a distributed Bragg reflector.

19. A light emitting device comprising:

a region of first conductivity type;

a region of second conductivity type;

an active region disposed between the region of first conductivity type and the region of second conductivity type, the active region being capable of emitting light having a wavelength λ_n in the region of second conductivity type; and

an electrode reflective of the light emitted by the active region, wherein the region of second conductivity type is disposed between the active region and the electrode;

wherein:

the active region comprises a first cluster and a second cluster;

a portion of the first cluster is located between $0.6\lambda_n$ and $0.75\lambda_n$ from a surface of the electrode; and

a portion of the first cluster is located between $1.2\lambda_n$ and $1.35\lambda_n$ from a surface of the electrode.

20. The light emitting device of Claim 19 wherein each of the first cluster and the second cluster comprise a plurality of quantum wells separated by at least one barrier layer.

21. The light emitting device of Claim 20 wherein a thickness of each of the first cluster and the second cluster is less than or equal to about $0.35\lambda_n$.

22. The light emitting device of Claim 20 wherein a thickness of each of the first cluster and the second cluster is less than or equal to about $0.15\lambda_n$.

23. The light emitting device of Claim 19 wherein the first cluster and the second cluster are separated by a barrier layer.

24. The light emitting device of Claim 19 wherein the active region comprises at least one III-nitride layer.

25. The light emitting device of Claim 19 wherein the active region comprises at least one III-phosphide layer.

26. A light emitting device comprising:

a region of first conductivity type;

a region of second conductivity type;

an active region disposed between the region of first conductivity type and the region of second conductivity type, the active region being capable of emitting light having a wavelength λ_n in the region of second conductivity type; and

an electrode reflective of the light emitted by the active region, wherein the region of second conductivity type is disposed between the active region and the electrode;

wherein the active region has a total thickness less than or equal to about $0.25\lambda_n$ and wherein a portion of the active region is located between $0.1\lambda_n$ and $0.3\lambda_n$ from a surface of the electrode.

27. An organic light emitting device comprising:

first and second insulating regions;

a phosphor layer disposed between the first and second insulating regions; and

a surface reflective of the light emitted by the phosphor layer, wherein one of the first and second insulating regions is disposed between the phosphor layer and the reflective surface;

wherein a center of the phosphor layer located at a distance from the reflective surface corresponding to a local maximum in extraction efficiency.